



Original Article

## Physical activity level and fall risk among community-dwelling older adults

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**Abstract.** [Purpose] To find the physical activity level and fall risk among the community-dwelling Malaysian older adults and determine the correlation between them. [Subjects and Methods] A cross-sectional study was conducted in which, the physical activity level was evaluated using the Rapid Assessment of Physical Activity questionnaire and fall risk with Fall Risk Assessment Tool. Subjects recruited were 132 community-dwelling Malaysian older adults using the convenience sampling method. [Results] The majority of the participants were under the category of under-active regular light-activities and most of them reported low fall risk. The statistical analysis using Fisher's exact test did not show a significant correlation between physical activity level and fall risk. [Conclusion] The majority of community-dwelling Malaysian older adults are performing some form of physical activity and in low fall risk category. But this study did not find any significant correlation between physical activity level and fall risk among community-dwelling older adults in Malaysia.

**Key words:** Fall risk, Physical activity, Community-dwelling older adults

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### INTRODUCTION

The percentage of older adults aged 60 years and above continues to increase worldwide including Malaysia. In Malaysia, an increase in older adults from 6.2% in 2000 to 9.2% in 2015, where in the year 2030 and 2050, it is expected to reach 14.4% and 23.6%, respectively<sup>1)</sup>. As they age, there are high chances of reduced physical function and limitations in their activities of daily livings (ADL's)<sup>2, 3)</sup>. Physical inactivity is the one of the major risk factors for mortality<sup>4)</sup>. Physical inactivity is evident in older adults in Malaysia due to various factors<sup>5)</sup>.

Among individuals with age 65 years and above, fall is the common reason leading to functional impairments and risk of death<sup>6)</sup>. Even though there are various risk factors leading to falls, lack of exercise is one of the risk factors leading to falls<sup>7)</sup>. Exercise and physical activity have been identified as single intervention that can prevent falls in older adults<sup>8)</sup>. Several studies identified the relationship between fall risk and level of physical activity among the elderly population in various countries. It was reported that physical activities ranging from leisure time physical activity to the daily moderate to vigorous-intensity physical activity in older adults will prevent and reduce the incidence of fall<sup>9, 10)</sup>. There are many studies regarding this concern, however, the studies exploring the correlation between physical activity level and fall risk among community dwelling Malaysian older adults is limited. As Malaysia is a multiethnic country, the older adults' perception about physical activity, falls and the factors (cultural barriers and social support) affecting their participation in the physical activity is different from developed countries<sup>11–16)</sup>. Therefore, the purpose of this study was to find the physical activity level and fall risk among the community-dwelling Malaysian older adults and determine the correlation between the two factors.

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**Table 1.** Frequency and percentage of Aerobic physical activity level (RAPA 1) and strength and flexibility exercise level (RAPA 2) (n=132)

RAPA 1 category	Frequency	Percentage (%)
Sedentary	35	26.5
Under-active	10	7.6
Under-active regular light-activities	67	50.8
Under-active regular	4	3.0
Active	16	12.1
Total	132	100.0

  

RAPA 2 category	Frequency	Percentage (%)
None	102	77.3
Strength training	1	0.8
Flexibility training	25	18.9
Both	4	3.0
Total	132	100.0

## SUBJECTS AND METHODS

A cross sectional correlation study was conducted among Malaysian older adults with ethical clearance obtained from INTI International University research ethics committee, Malaysia. A sample of 132 community-dwelling older adults (60 years old or above) from different parks around the housing area, shopping malls, restaurants, and public places in Selangor and Negeri Sembilan, who were able to communicate in English, independent in the activities of daily living and functional activities, irrespective of their fall history, as identified by subjective assessment were selected by the convenience sampling method. Subjects were excluded, if they had any medical condition (musculoskeletal, neurological, cardio-respiratory conditions) and/or symptoms that affect their participation in the physical activity and cognitive impairment, which limit their ability to communicate. Written informed consent was obtained from subjects who fulfilled the inclusion criteria after a clear explanation of the details of the study.

To assess the fall risk, part 1 of the Fall Risk Assessment Tool (FRAT) was used together with the Hodkinson Abbreviated Mental Test Score (AMTS) with permission<sup>17)</sup>. A score ranging from 5–11 was considered as low fall risk, 12–15 was medium fall risk, and 16–20 was high fall risk<sup>18)</sup>. As the data was collected from public places, physical activity level was assessed through the Rapid Assessment of Physical Activity (RAPA) questionnaire with permission, which is an easy to use, and valid tool<sup>19, 20)</sup>. This tool has two components: aerobic (RAPA 1), and strength and flexibility (RAPA 2), which are the components of physical activity. Scores were then categorized based on the scoring protocol<sup>20)</sup>. The data were analyzed using IBM SPSS Statistics 23 software. Descriptive analysis of percentages and frequencies were used to report the physical activity level and fall risk. Whereas, Fisher's exact test was used to determine the correlation between physical activity level of RAPA 1 and RAPA 2 and fall risk. The level of significance was set at  $p < 0.05$ .

## RESULTS

Out of 132 participants, 65.15% (86) were females and 34.85% (46) were males. The mean age of participants was  $70.62 \pm 7.39$  years. The percentage of Chinese, Indian and Malay participants were 45.45% (60), 35.61% (47) and 18.94% (25) respectively. 94.7% (125) participants were in low fall risk and 5.3% (7) participants were in medium fall risk. The aerobic physical activity level (RAPA 1) and strength and flexibility exercise level (RAPA 2) of participants were given in Table 1. Statistical analysis did not find a significant correlation between fall risk and aerobic physical activity level (RAPA 1) ( $p=0.843$ ; Fisher's exact test). Similarly, Fisher's exact test did not demonstrate a significant correlation between fall risk and strength and flexibility exercise level (RAPA 2) ( $p=0.502$ , Fisher's exact test).

## DISCUSSION

The objective of this study was to identify the physical activity level and fall risk among community-dwelling Malaysian older adults and find the correlation between them. In this study only 12.1% reported that they were physically active and large percentage 50.8% reported under-active regular light-activities, which is similar to previous study result<sup>21)</sup>. Even though physically active older adults were less, most of them 73.5% performed at least some form of physical activity and the percentage was higher than reported in previous studies<sup>5, 11)</sup>. But the percentage of physically active (to the recommended level) older adults were less than previously reported literature. It could be due to very old participants (mean age of 70.62 years) in this study, compared to previous studies, because age indicated to have a negative relationship with the total physical activity<sup>11, 21)</sup>. It was found that the majority of the participants were in the category of low risk. However, the small percentage (5.3%) was in the medium fall risk category. Most literature reported only the history of falls, whereas this

study provided a combined score (FRAT score) to identify the fall risk of community dwelling older adults<sup>22, 23</sup>). Hence, it is difficult to compare the results, but the percentage of medium fall risk reported in this study closely matches with the percentage of falls reported among community-dwelling older adults in a previous study<sup>24</sup>).

The results of this study did not show a significant correlation between physical activity level and fall risk among the community-dwelling older adults in Malaysia. It is not comparable to the results found in the most of the literature that people with higher physical activity level have a lower risk and incidence of falling<sup>25, 26</sup>). It's probably due to small sample size with unequal distribution of major races, and the assessment method of physical activity as most of the questionnaire to assess physical activity level show limited reliability and validity<sup>27</sup>). Another reason may be the fall risk reported in this study is skewed towards low risk category due to the sampling method used and unequal representation of races. However, few studies also reported results similar to this study result<sup>24, 28</sup>). Surprisingly, a study reported higher fall risk in older males who engage in more physical activities, and increasing fall risk with increasing physical activity with high leg power. They attributed more household activities for the increased fall risk and it was also predicted that, more powerful man undertake more activities, which increases their fall risk<sup>29</sup>). Correspondingly, most of the older adults in this study were only under-active regular light-activities category. Hence, as their activities were low, fall risk may be low due to less challenging activities they undertake.

The results of this study cannot be generalized to whole Malaysian older adult population due to small sample size, unequal representation of major races due to convenience sampling method, limited location in which the study was conducted and subjective method of assessment of physical activity and fall risk.

In conclusion, the majority of community-dwelling Malaysian older adults are performing some form of physical activity and in low fall risk category. But this study did not find any significant correlation between physical activity level and fall risk among community-dwelling older adults in Malaysia. Future research is vital to find out the reason associated with physical activity level and fall risk, with large samples and objective measures, so that the community may aware of the role of physical activity in fall risk reduction.

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